

# ELR Series

## 線性馬達機械手(含馬達與控制器)

一般環境 / 軸棒線馬

Standard / Linear Shaft Motor

### CONTENTS

#### 線性馬達機械手(含馬達與控制器)-ELR Series

軸棒驅動 / 一般環境

小型 SMALL

ELR20



磁棒外徑  $\varnothing$  22mm  
最大行程 990mm  
連續可搬重量 15kg

中型 MEDIUM

ELR25



磁棒外徑  $\varnothing$  25mm  
最大行程 1300mm  
連續可搬重量 24kg

大型 LARGE

ELR32



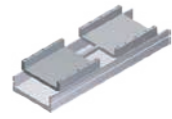
磁棒外徑  $\varnothing$  32mm  
最大行程 1940mm  
連續可搬重量 51kg



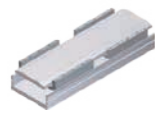


滑座  
Slider

## 多樣滑座特注 Various Carriage Options



雙滑座雙馬達型  
Double slider  
double motor drive



雙滑座單馬達型  
Double slider  
single motor drive



滑座加長單馬達型  
Long slider  
single motor drive

滑軌  
Linear guide

## 採用THK靜音型高精度滑軌 THK guiding system

靜音運轉:  
Quiet operation:

可有效較低運轉時噪音、提升運轉平順性、壽命與潤滑效率。具有更廣泛的產業應用性，更適用於高速、寧靜與低發塵需求的高科技產業。

Lower noise during operation can effectively enhance the smoothness life and lubrication efficiency. It is broader in different industrial application and more suitable for high speed, Quiet and low dust requirement of high-tech industries.



本體  
Frame body

## 高剛性本體/高剛性上蓋 High rigidity body / High rigidity cover

高剛性本體:  
High rigidity body

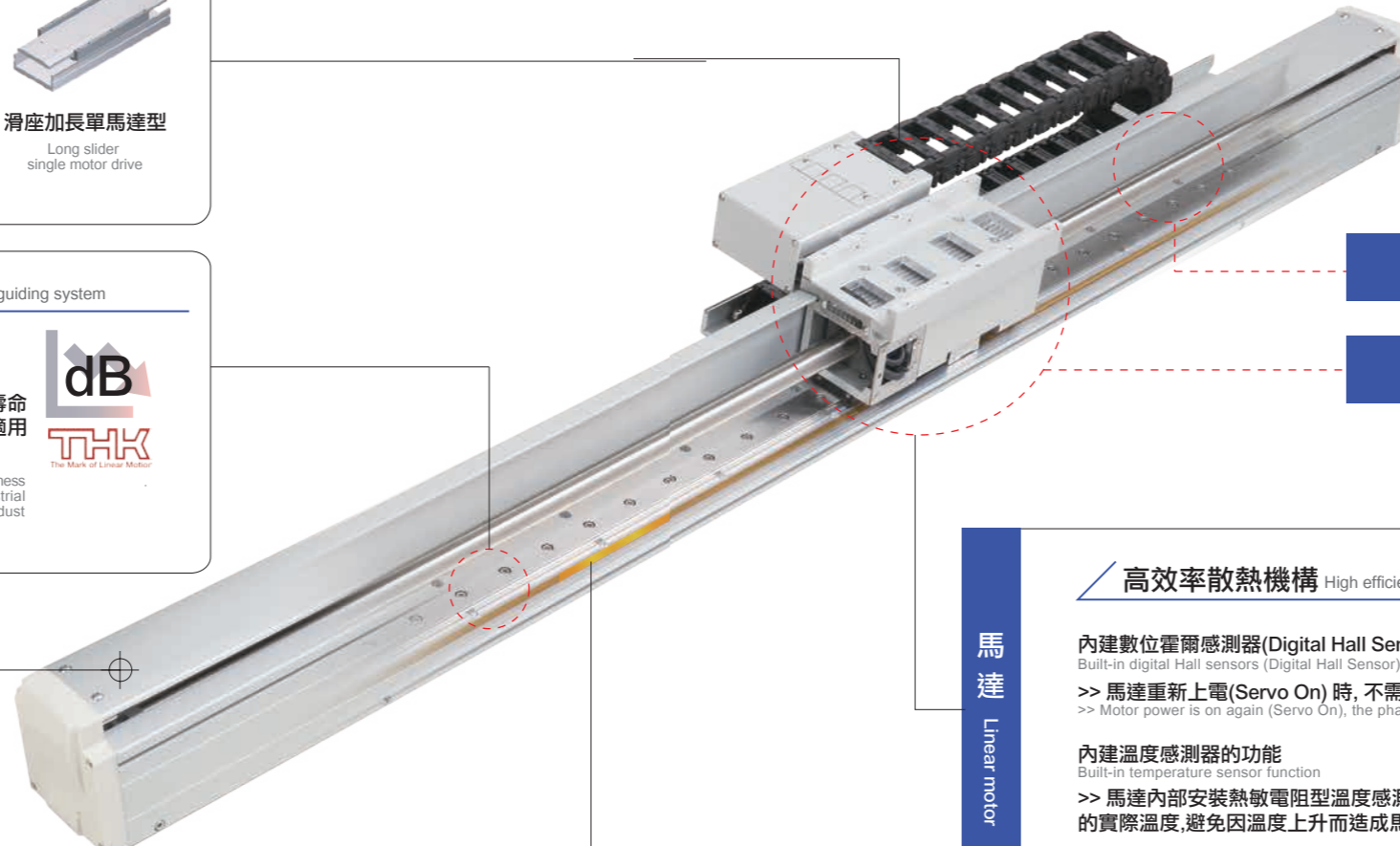
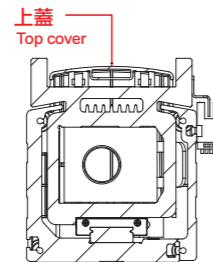
採用一體成形鋁擠型結構並經元素分析，得到最好的剛性與重量比之結構設計。

The profile is made by one-piece molded and extruded aluminum structure. By doing elemental analysis, we can get the best the ratio of rigidity and weight of the structure.

耐繞曲上蓋:  
High rigidity cover

特殊抗繞曲設計，長行程使用時，上蓋不容易扭曲變形。

Special anti-flexing design. When it is long stroke, the cover is not easy to distort.



定子：磁棒  
Stator: Magnetic bar

動子：線性馬達模組  
Rotor: Linear motor

馬達  
Linear motor

## 高效率散熱機構 High efficiency radiating module

內建數位霍爾感測器(Digital Hall Sensor)的功能  
Built-in digital Hall sensors (Digital Hall Sensor) function

>> 馬達重新上電(Servo On)時，不需位移即可找到相位角。  
>> Motor power is on again (Servo On), the phase angle can be found without any movement.

內建溫度感測器的功能  
Built-in temperature sensor function

>> 馬達內部安裝熱敏電阻型溫度感測器，可藉由驅動器或電阻計立即獲得馬達內部的實際溫度，避免因溫度上升而造成馬達過熱而損壞。

>> By Installed the motor thermistor type temperature sensor, the actual temperature inside motor can be measured by driver or resistance meter immediately in order to avoid the damage caused by temperature rise and motor overheating.

光學尺  
Encoder

## 可選配光學尺及磁性尺 Encoder

光學尺或磁性尺彈性搭配  
Optical encoder or magnetic encoder is optional.

>> 考慮使用環境的需求，有光學尺與磁性尺的設計可選擇。依據磁性尺選擇，可達到分解能0.001mm的高精度。

>> Due to the requirement of different environments, optical encoder or magnetic encoder is optional. The highest resolution of magnetic encoder can up to 0.001mm.

重複定位精度±0.002mm  
Repeatability accuracy ±0.002mm

>> 超越滾珠螺桿的精度需求。  
>> Exceed the accuracy of ball screw.

\*光學尺可特注外置形式。\* External mounted linear scale can be choosen.

# ELR20

單軸/1-axis

軸棒線馬  
Linear Shaft Motor



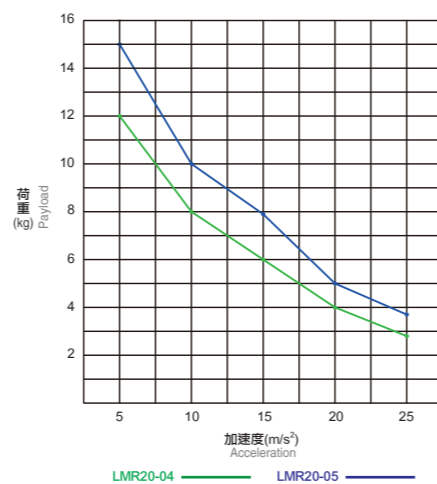
最大行程 Maximum Stroke	990mm	最高速度 Maximum Speed	2500mm/s	連續推力 Continuous thrust	55N
連續可搬重量 Continuous Payload	15kg	磁棒外徑 Outer dia. of stator	∅22mm	直線滑軌 Linear Guide	24X8.5 1 pcs

### 基本仕様 Specification

規格 Spec	型號 Model	LMR20-04	LMR20-05
	位置重複精度 Repeatability (mm)	±0.002mm	
最大推力 Max. Thrust (N)	177	221	
連續推力 Continuous Thrust (N)	44	55	
連續可搬重量 Continuous Payload (kg)	12	15	
標準行程 Stroke / Pitch (mm)	單馬達 N	150-990mm/60間隔	180-960mm/60間隔
	雙馬達 D	80-800mm/60間隔	80-740mm/60間隔
最高速度 Maximum Speed (mm/s) ※1	2500mm/s		
部品 Parts	定子外徑 Outer Dia. of Stator	∅ 20	
	光學尺廠牌 Brand of Linear Scale	RENISHAW	
	讀頭 Reader	RH200X05A00A	
	Z相原點 Origin of Z Phase	A-9541-0037	
光學尺解析度 Resolution of Linear Scale	0.001mm		

此圖僅供參考，出貨規格詳見尺寸圖面  
The picture is just for the reference. Please check the the actual dimensions on the drawing.

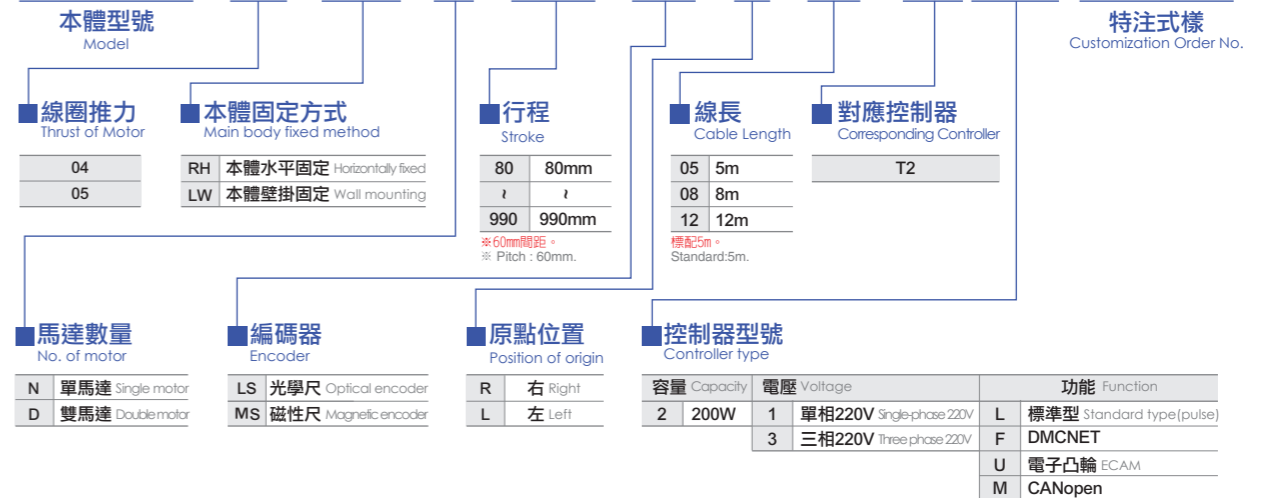
### 加速度-連續可搬重量 Acceleration-Continuous Payload



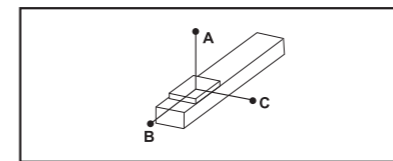
※1 連續可搬重量為到達線速度1m/s，最大加速度5m/s²固定行程來回，不同情況會有不同。  
The continuous payload is the data when the robot runs with maximum speed 1m/s and acceleration 5m/s². Different application will have different result.

### 型號表示方式 Ordering Method

## ELR20 - 04 - RH - N - 990 - LS - R - 05 - T2 21L - A001

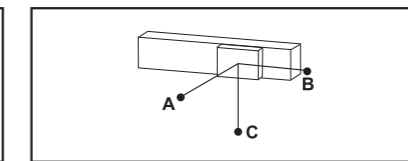


### 容許負載力距表 Allowable Overhang



(單位 Unit:mm)

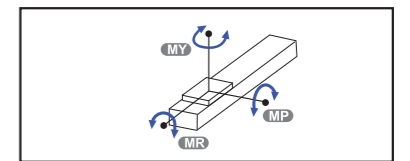
速度 Speed (m/s)	荷重 Load (kg)	水平安裝 Horizontal Installation ※2			
		A	B	C	
ELR 20 - 04 - RH	1	12	375	100	
	1	5.5	890	253	
	1.5	6.5	305	143	
	1.5	3	710	345	
	2	4	265	193	
	2	2	559	415	
ELR 20 - 05 - RH	1	15	360	92	
	1	7.5	790	220	
	1.5	9.2	256	115	
	1.5	4.5	570	275	
	2	5.6	225	390	
	2	2.5	550	405	
ELR 20 - 04 - LW	2.5	3.8	260	255	
	2.5	2	515	520	
	ELR 20 - 05 - LW	1	15	29	29
		1	7.5	70	70
		1.5	9	36	120
		1.5	4.5	84	275
2		5.7	45	158	
2		2.5	115	405	
ELR 20 - 04 - RH	2.5	3.8	67	255	
	2.5	2	137	520	
	ELR 20 - 05 - LW	1	15	29	29
		1	7.5	70	70
		1.5	9	36	120
		1.5	4.5	84	275
2		5.7	45	158	
2		2.5	115	405	
ELR 20 - 04 - LW	2.5	3.8	67	255	
	2.5	2	137	520	



(單位 Unit:mm)

速度 Speed (m/s)	荷重 Load (kg)	壁掛安裝 Wall Installation ※2			
		A	B	C	
ELR 20 - 04 - LW	1	12	39	100	
	1	6	90	230	
	1.5	7	49	131	
	1.5	3.5	108	294	
	2	4	66	193	
	2	2	142	415	
ELR 20 - 05 - LW	2.5	2.9	86	275	
	2.5	1.5	175	560	
	1	15	29	29	
	1	7.5	70	70	
	1.5	9	36	120	
	1.5	4.5	84	275	
ELR 20 - 04 - RH	2	5.7	45	158	
	2	2.5	115	405	
	2.5	3.8	67	255	
	2.5	2	137	520	
	ELR 20 - 05 - LW	1	15	29	29
		1	7.5	70	70
1.5		9	36	120	
1.5		4.5	84	275	
2		5.7	45	158	
2		2.5	115	405	
ELR 20 - 04 - RH	2.5	3.8	67	255	
	2.5	2	137	520	

### 靜態容許負載慣量 Static Loading Moment



型號 Model	MY	MP	MR
LMR 20 - 04	63	63	26
	79	79	26
	79	79	26
LMR 20 - 05	63	63	26
	79	79	26
	79	79	26

※2 相同速度下加速度時間不同，加速度也隨之變化，荷重也隨之改變，表為加速度時間0.2s。  
Even the speed is same, if acceleration and acceleration time is changed, the payload will be different. Above chart is based on acceleration time 0.2 sec.

### 對應控制器一覽表 Corresponding Controller Chart

外觀 Exterior	控制器型號 Controller Model	選配介面 Control Mode	電氣規格 Electrical Spec.	詳細參閱 Reference Page
	T2	標準型 Pulse Control Mode	單相或三相220V Single-phase 220V or Three phase 220V	P.533
		DMCNET		
		電子凸輪 ECAM		
		CANopen		

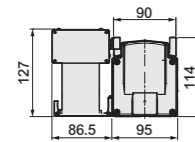
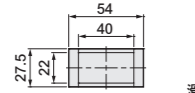
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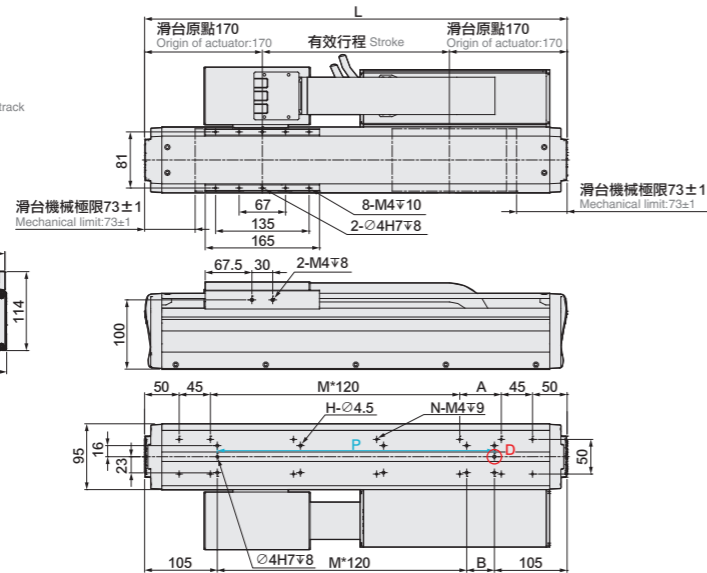
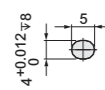
CHELIC可提供圖面

單位 Unit : mm

履帶截面圖  
Sectional view of connecting track



D View



有效行程 stroke	150	210	270	330	390	450	510	570	630	690	750	810	870	930	990
L	490	550	610	670	730	790	850	910	970	1030	1090	1150	1210	1270	1330
A	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60
B	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40
P	280	340	400	460	520	580	640	700	760	820	880	940	1000	1060	1120
M	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9
N	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26
H	8	8	10	10	12	12	14	14	16	16	18	18	20	20	22
KG	9.2	9.9	10.6	11.3	12	12.6	13.3	14	14.7	15.3	16	16.7	17.4	18.1	18.7

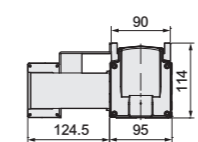
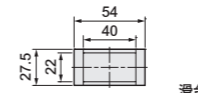
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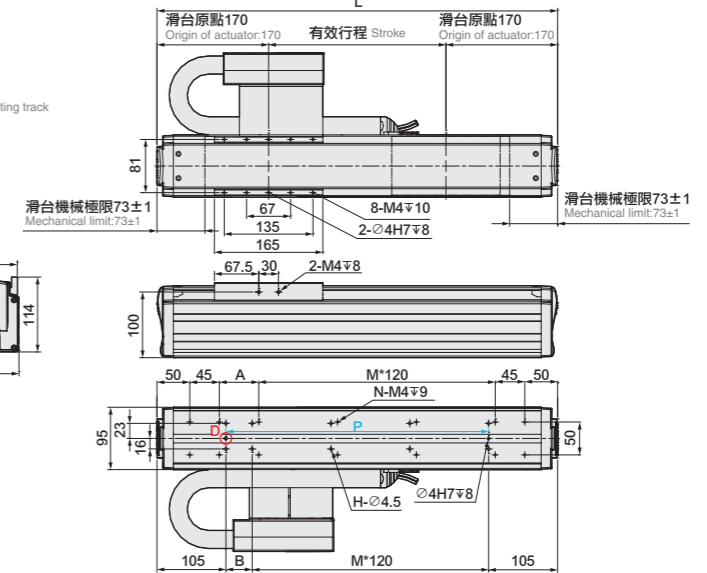
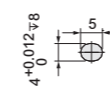
CHELIC可提供圖面

單位 Unit : mm

履帶截面圖  
Sectional view of connecting track



D View



有效行程 stroke	150	210	270	330	390	450	510	570	630	690	750	810	870	930	990
L	490	550	610	670	730	790	850	910	970	1030	1090	1150	1210	1270	1330
A	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60
B	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40
P	280	340	400	460	520	580	640	700	760	820	880	940	1000	1060	1120
M	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9
N	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26
H	8	8	10	10	12	12	14	14	16	16	18	18	20	20	22
KG	9.2	9.9	10.5	11.2	11.8	12.5	13.1	13.8	14.4	15.1	15.7	16.4	17	17.7	18.3

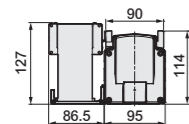
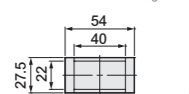
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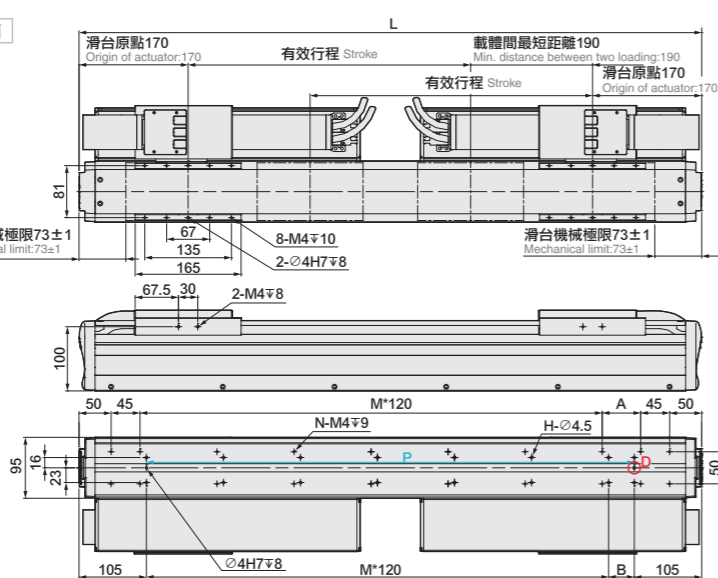
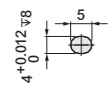
CHELIC可提供圖面

單位 Unit : mm

履帶截面圖  
Sectional view of connecting track



D View



有效行程 stroke	80	140	200	260	320	380	440	500	560	620	680	740	800
L	610	670	730	790	850	910	970	1030	1090	1150	1210	1270	1330
A	60	120	60	120	60	120	60	120	60	120	60	120	60
B	40	100	40	100	40	100	40	100	40	100	40	100	40
P	400	460	520	580	640	700	760	820	880	940	1000	1060	1120
M	3	3	4	4	5	5	6	6	7	7	8	8	9
N	14	14	16	16	18	18	20	20	22	22	24	24	26
H	10	10	12	12	14	14	16	16	18	18	20	20	22
KG	15.1	15.8	16.4	17.1	17.8	18.5	19.2	19.8	20.5	21.2	21.9	22.6	23.2

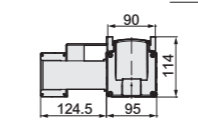
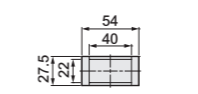
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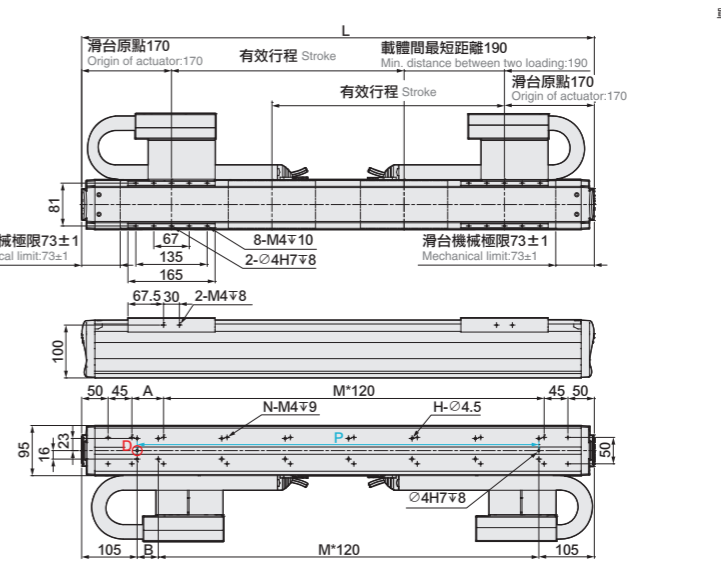
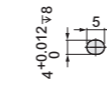
CHELIC可提供圖面

單位 Unit : mm

履帶截面圖  
Sectional view of connecting track



D View



有效行程 stroke	80	140	200	260	320	380	440	500	560	620	680	740	800
L	610	670	730	790	850	910	970	1030	1090	1150	1210	1270	1330
A	60	120	60	120	60	120	60	120	60	120	60	120	60
B	40	100	40	100	40	100	40	100	40	100	40	100	40
P	400	460	520	580	640	700	760	820	880	940	1000	1060	1120
M	3	3	4	4	5	5	6	6	7	7	8	8	9
N	14	14	16	16	18	18	20	20	22	22	24	24	26
H	10	10	12	12	14	14	16	16	18	18	20	20	22
KG	15.2	15.8	16.4	17	17.6	18.2	18.8	19.4	20	20.6	21.2	21.8	22.4

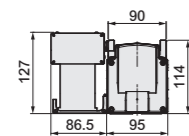
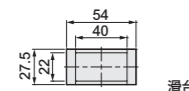
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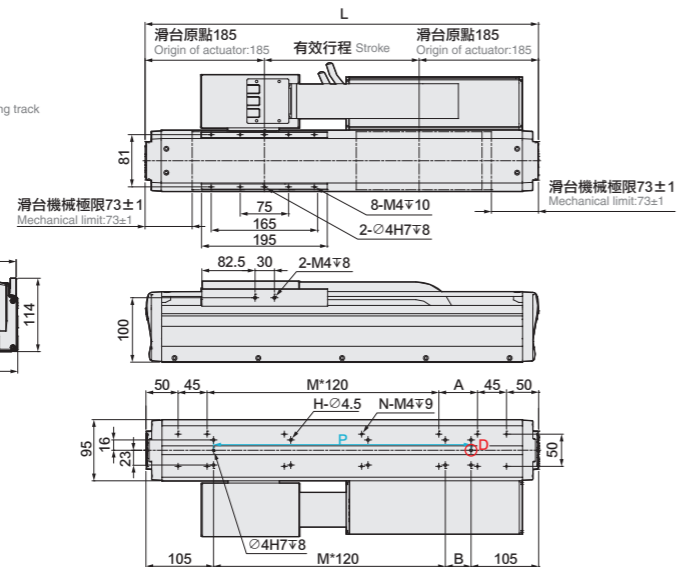
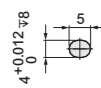
CHELIC可提供圖面

單位 Unit : mm

履帶截面圖  
Sectional view of connecting track



D View



有效行程 stroke	180	240	300	360	420	480	540	600	660	720	780	840	900	960
L	550	610	670	730	790	850	910	970	1030	1090	1150	1210	1270	1330
A	120	60	120	60	120	60	120	60	120	60	120	60	120	60
B	100	40	100	40	100	40	100	40	100	40	100	40	100	40
P	340	400	460	520	580	640	700	760	820	880	940	1000	1060	1120
M	2	3	3	4	4	5	5	6	6	7	7	8	8	9
N	12	14	14	16	16	18	18	20	20	22	22	24	24	26
H	8	10	10	12	12	14	14	16	16	18	18	20	20	22
KG	10.2	10.9	11.6	12.3	12.9	13.6	14.3	15	15.7	16.3	17	17.7	18.4	19.1

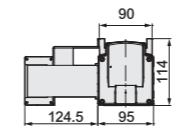
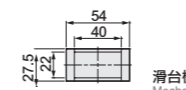
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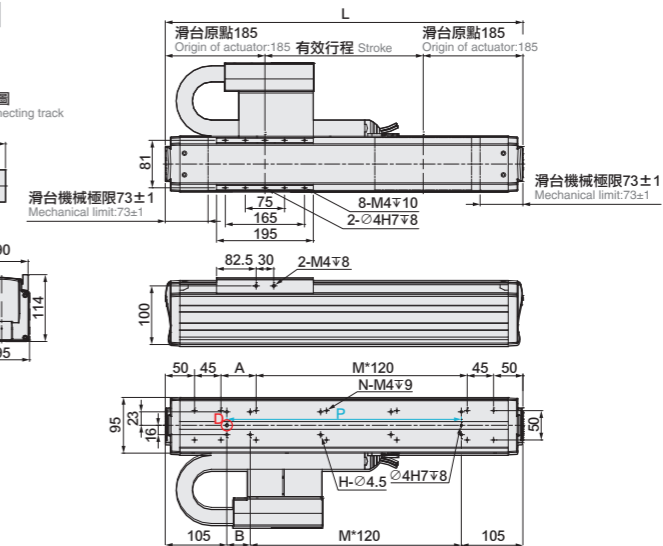
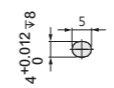
CHELIC可提供圖面

單位 Unit : mm

履帶截面圖  
Sectional view of connecting track



D View



有效行程 stroke	180	240	300	360	420	480	540	600	660	720	780	840	900	960
L	550	610	670	730	790	850	910	970	1030	1090	1150	1210	1270	1330
A	120	60	120	60	120	60	120	60	120	60	120	60	120	60
B	100	40	100	40	100	40	100	40	100	40	100	40	100	40
P	340	400	460	520	580	640	700	760	820	880	940	1000	1060	1120
M	2	3	3	4	4	5	5	6	6	7	7	8	8	9
N	12	14	14	16	16	18	18	20	20	22	22	24	24	26
H	8	10	10	12	12	14	14	16	16	18	18	20	20	22
KG	10.3	11	11.6	12.2	12.8	13.5	14.1	14.7	15.1	16	16.6	17.2	17.9	18.5

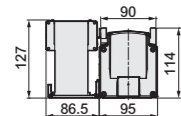
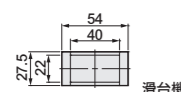
### ELR20-05-RH-D



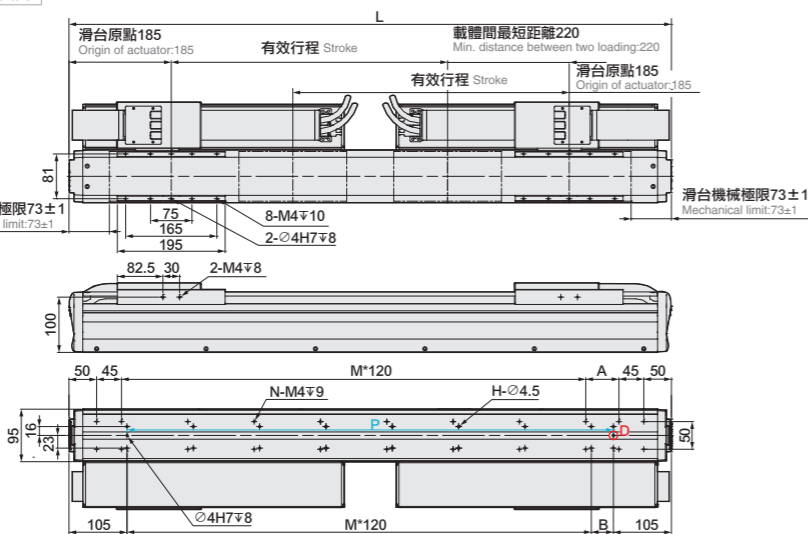
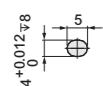
CHELIC可提供圖面

單位 Unit : mm

履帶截面圖  
Sectional view of connecting track



D View



有效行程 stroke	80	140	200	260	320	380	440	500	560	620	680	740
L	670	730	790	850	910	970	1030	1090	1150	1210	1270	1330
A	120	60	120	60	120	60	120	60	120	60	120	60
B	100	40	100	40	100	40	100	40	100	40	100	40
P	460	520	580	640	700	760	820	880	940	1000	1060	1120
M	3	4	4	5	5	6	6	7	7	8	8	9
N	14	16	16	18	18	20	20	22	22	24	24	26
H	10	12	12	14	14	16	16	18	18	20	20	22
KG	16.3	17	17.7	18.4	18.5	19.7	20.4	21.1	21.8	22.4	23.1	23.8

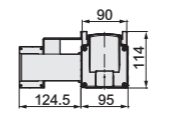
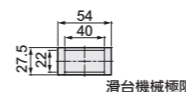
### ELR20-05-LW-D



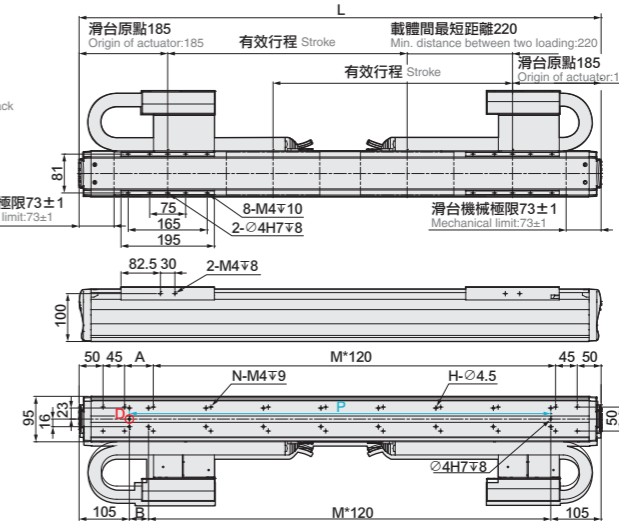
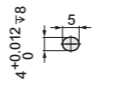
CHELIC可提供圖面

單位 Unit : mm

履帶截面圖  
Sectional view of connecting track



D View



有效行程 stroke	80	140	200	260	320	380	440	500	560	620	680	740
L	670	730	790	850	910	970	1030	1090	1150	1210	1270	1330
A	120	60	120	60	120	60	120	60	120	60	120	60
B	100	40	100	40	100	40	100	40	100	40	100	40
P	460	520	580	640	700	760	820	880	940	1000	1060	1120
M	3	4	4	5	5	6	6	7	7	8	8	9
N	14	16	16	18	18	20	20	22	22	24	24	26
H	10	12	12	14	14	16	16	18	18	20	20	22
KG	16.4	17	17.6	18.2	18.8	19.4	20	20.6	21.2	21.8	22.4	23

# ELR25

單軸/1-axis

軸棒線馬  
Linear Shaft Motor



最大行程 Maximum Stroke	1300mm	最高速度 Maximum Speed	2500mm/s	連續推力 Continuous Thrust	96N
連續可搬重量 Continuous Payload	24kg	磁棒外徑 Outer dia. Of stator	∅25mm	直線滑軌 Linear Guide	42X9.5 1 pcs

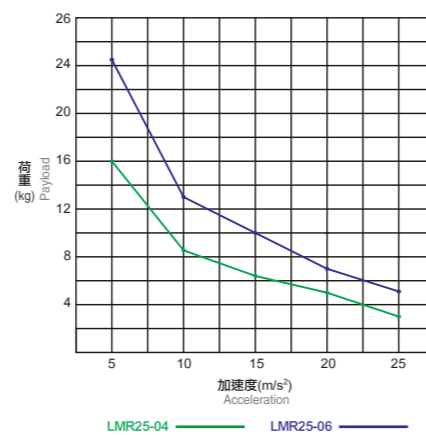
此圖僅供參考，出貨規格詳見尺寸圖面  
The picture is just for the reference. Please check the the actual dimensions on the drawing.

## 基本仕様 Specification

規格 Spec	型號 Model	LMR25-04	LMR25-06
	位置重複精度 Repeatability (mm)	±0.002mm	
	最大推力 Max. Thrust (N)	257	386
	連續推力 Continuous Thrust (N)	64	96
	連續可搬重量 Continuous Payload (kg)	16	24
標準行程 Stroke / Pitch (mm)	單馬達 N	150-1300mm/60間隔	120-1260mm/60間隔
	雙馬達 D	70-1090mm/60間隔	50-1010mm/60間隔
最高速度 Maximum Speed (mm/s) ※1	2500mm/s		
部品 Parts	定子外徑 Outer Dia. of Stator	∅ 25	
	光學尺廠牌 Brand of Linear Scale	RENISHAW	
	讀頭 Reader	RH200X05A00A	
	Z相原點 Origin of Z Phase	A-9541-0037	
光學尺解析度 Resolution of Linear Scale	0.001mm		

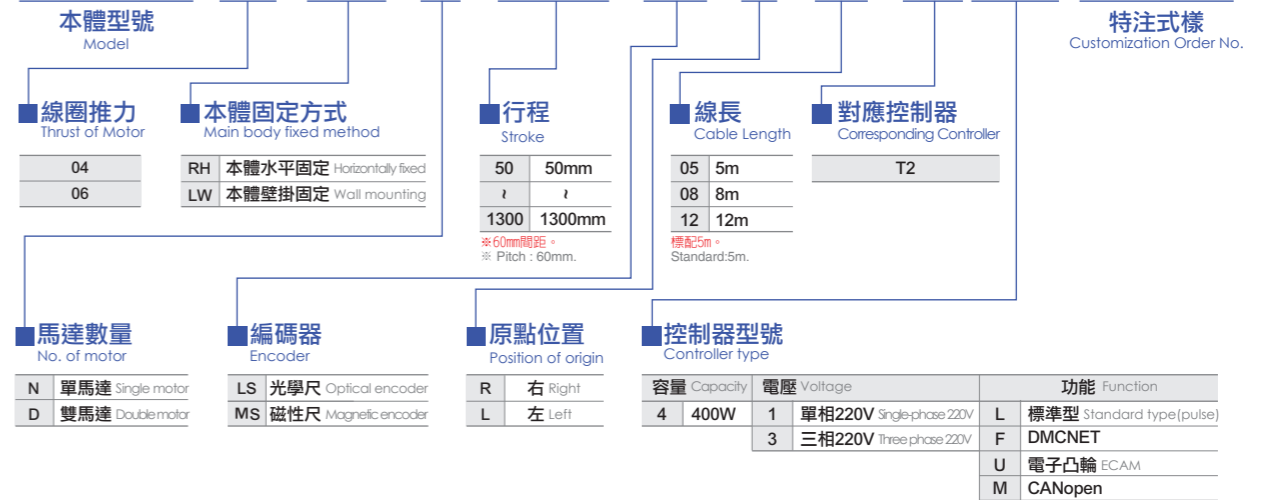
※1 連續可搬重量為到達線速度1m/s，最大加速度5m/s<sup>2</sup>固定行程來回，不同情況會有不同。  
The continuous payload is the data when the robot runs with maximum speed 1m/s and acceleration 5m/s<sup>2</sup>. Different application will have different result.

## 加速度-連續可搬重量 Acceleration-Continuous Payload

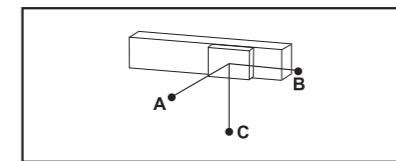
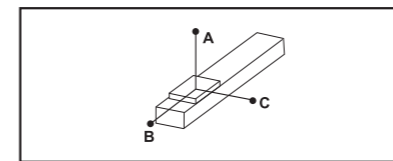


## 型號表示方式 Ordering Method

# ELR25-04-RH-N-1300-LS-R-05-T241L-A001



## 容許負載力距表 Allowable Overhang



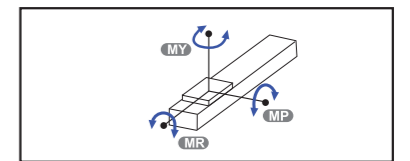
(單位 Unit:mm)

水平安裝 Horizontal Installation ※2					
速度 Speed (m/s)	荷重 Load (kg)	A B C			
		1	16	550	151
1	8	1155	333	204	
1.5	8.8	435	210	116	
1.5	4.5	890	440	245	
2	5.3	385	283	138	
2	2.5	850	635	310	
2.5	3.4	460	460	198	
2.5	1.5	1070	1080	465	
1	24.5	440	114	54	
1	12	980	276	132	
1.5	13.7	345	160	72	
1.5	6.5	790	385	170	
2	8.4	305	218	88	
2	4	680	505	202	
2.5	5.6	350	350	127	
2.5	3	685	685	250	

(單位 Unit:mm)

壁掛安裝 Wall Installation ※2					
速度 Speed (m/s)	荷重 Load (kg)	A B C			
		1	16	92	150
1	8	204	333	1155	
1.5	8.8	116	210	435	
1.5	4.5	246	440	890	
2	5.3	138	284	385	
2	2.5	310	635	850	
2.5	3.4	198	455	458	
2.5	1.5	465	1080	1070	
1	24.5	54	114	440	
1	12	132	275	990	
1.5	13.7	72	160	345	
1.5	7	158	355	730	
2	8.4	88	218	305	
2	4	204	505	680	
2.5	5.6	126	350	350	
2.5	3	250	685	685	

## 靜態容許負載慣量 Static Loading Moment



(單位 Unit:N.m)

型號 Model	MY	MP	MR
LMR 25 - 04	112	112	74
LMR 25 - 06	147	147	74

※2 相同速度下加速度時間不同，加速度也隨之變化，荷重也隨之改變，表為加速度時間0.2s。  
Even the speed is same, if acceleration and acceleration time is changed, the payload will be different. Above chart is based on acceleration time 0.2 sec.

## 對應控制器一覽表 Corresponding Controller Chart

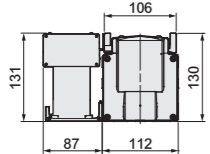
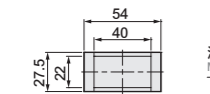
外觀 Exterior	控制器型號 Controller Model	選配介面 Control Mode	電氣規格 Electrical Spec.	詳細參閱 Reference Page
	T2	標準型 Pulse Control Mode	單相或三相220V Single-phase 220V or Three phase 220V	P.533
		DMCNET		
		電子凸輪 ECAM		
		CANopen		

### ELR25-04-RH-N

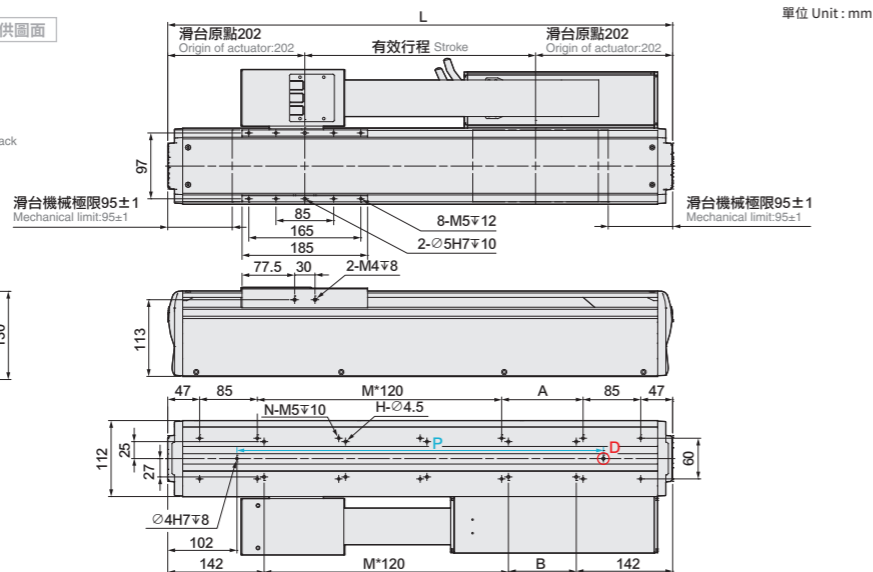
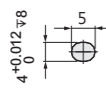


CHELIC可提供圖面

履帶截面圖  
Sectional view of connecting track



D View



單位 Unit : mm

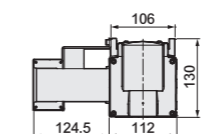
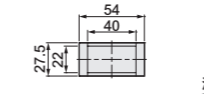
有效行程 stroke	100	160	220	280	340	400	460	520	580	640	700	760	820	880	940	1000	1060	1120	1180	1240	1300	
L	504	564	624	684	744	804	864	924	984	1044	1104	1164	1224	1284	1344	1404	1464	1524	1584	1644	1704	
A	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60
B	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40
P	300	360	420	480	540	600	660	720	780	840	900	960	1020	1080	1140	1200	1260	1320	1380	1440	1500	
M	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10	10	11	11	11
N	10	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	30
H	6	8	8	10	10	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26	26
KG	11.6	12.5	13.5	14.5	15.4	16.4	17.3	18.3	19.3	20.2	21.2	22.1	23.1	24.1	25	26	27	27.9	28.9	29.8	30.8	30.8

### ELR25-04-LW-N

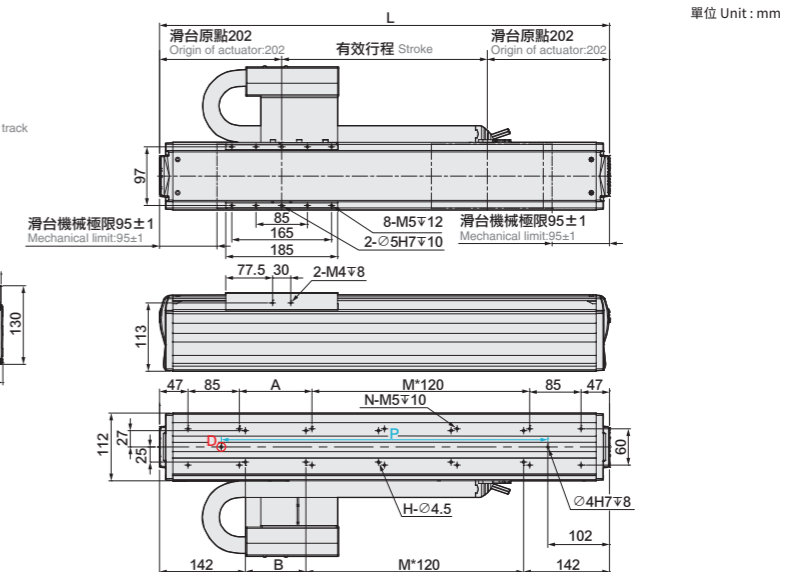
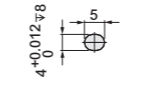


CHELIC可提供圖面

履帶截面圖  
Sectional view of connecting track



D View



單位 Unit : mm

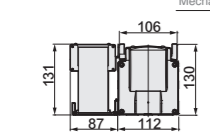
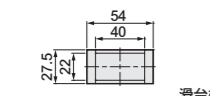
有效行程 stroke	100	160	220	280	340	400	460	520	580	640	700	760	820	880	940	1000	1060	1120	1180	1240	1300	
L	504	564	624	684	744	804	864	924	984	1044	1104	1164	1224	1284	1344	1404	1464	1524	1584	1644	1704	
A	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60
B	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40
P	300	360	420	480	540	600	660	720	780	840	900	960	1020	1080	1140	1200	1260	1320	1380	1440	1500	
M	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10	10	11	11	11
N	10	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	30
H	6	8	8	10	10	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26	26
KG	11.8	12.7	13.6	14.5	15.4	16.3	17.2	18.1	19	20	20.9	21.8	22.7	23.6	24.5	25.4	26.3	27.2	28.1	29	29	30

### ELR25-04-RH-D

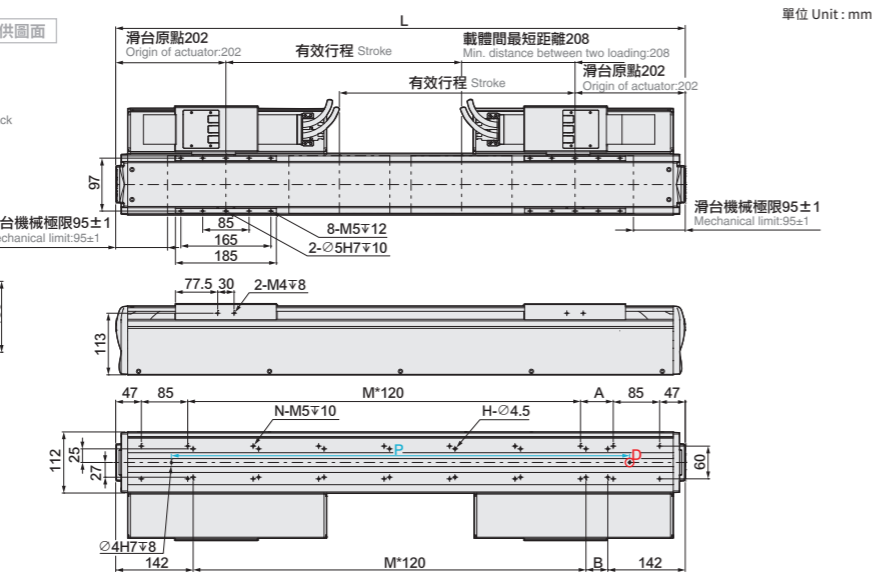
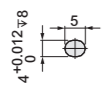


CHELIC可提供圖面

履帶截面圖  
Sectional view of connecting track



D View



單位 Unit : mm

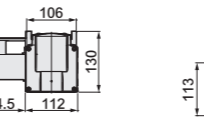
有效行程 stroke	70	130	190	250	310	370	430	490	550	610	670	730	790	850	910	970	1030	1090
L	684	744	804	864	924	984	1044	1104	1164	1224	1284	1344	1404	1464	1524	1584	1644	1704
A	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120
B	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100
P	480	540	600	660	720	780	840	900	960	1020	1080	1140	1200	1260	1320	1380	1440	1500
M	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10	10	11	11
N	14	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30
H	10	10	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26
KG	20	20.9	21.9	22.8	23.8	24.8	25.7	26.7	27.6	28.6	29.6	30.5	31.5	32.4	33.4	34.4	35.3	36.3

### ELR25-04-LW-D

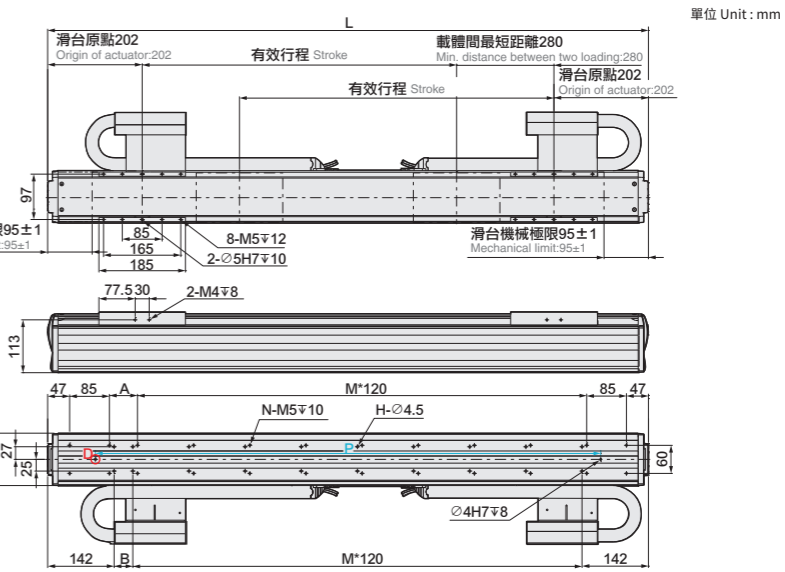
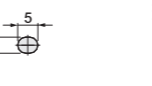


CHELIC可提供圖面

履帶截面圖  
Sectional view of connecting track



D View



單位 Unit : mm

有效行程 stroke	70	130	190	250	310	370	430	490	550	610	670	730	790	850	910	970	1030	1090
L	684	744	804	864	924	984	1044	1104	1164	1224	1284	1344	1404	1464	1524	1584	1644	1704
A	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120
B	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100
P	480	540	600	660	720	780	840	900	960	1020	1080	1140	1200	1260	1320	1380	1440	1500
M	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10	10	11	11
N	14	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30
H	10	10	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26
KG	20	20.8	21.7	22.6	23.5	24.4	25.2	26.1	27	27.9	28.8	29.6	30.5	31.4	32.3	33.2	34	34.9



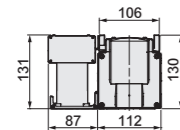
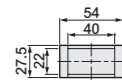
### ELR25-06-RH-N



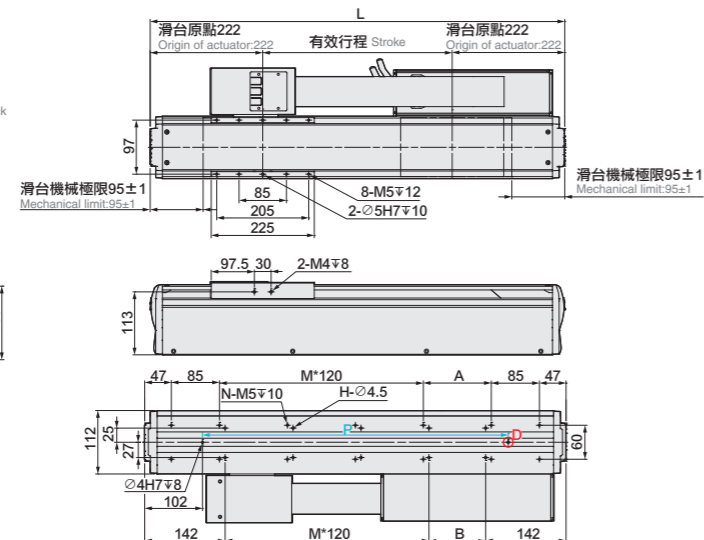
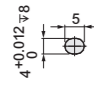
CHELIC可提供圖面

單位 Unit : mm

履帶截面圖  
Sectional view of connecting track



D View



有效行程 stroke	120	180	240	300	360	420	480	540	600	660	720	780	840	900	960	1020	1080	1140	1200	1260
L	564	624	684	744	804	864	924	984	1044	1104	1164	1224	1284	1344	1404	1464	1524	1584	1644	1704
A	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120
B	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100
P	360	420	480	540	600	660	720	780	840	900	960	1020	1080	1140	1200	1260	1320	1380	1440	1500
M	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10	10	11	11
N	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30
H	8	8	10	10	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26
KG	13.6	14.5	15.5	16.5	17.4	18.4	19.3	20.3	21.3	22.2	23.2	24.1	25.1	26.1	27	28	29	30	30.9	31.8

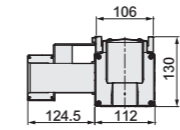
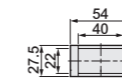
### ELR25-06-LW-N



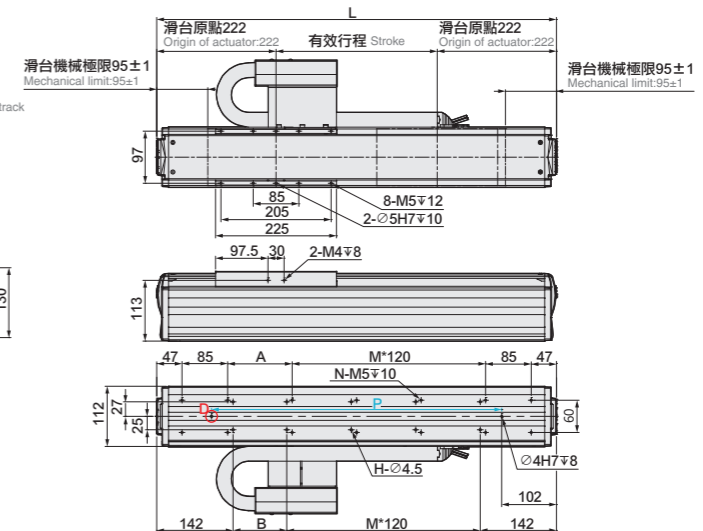
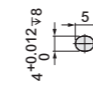
CHELIC可提供圖面

單位 Unit : mm

履帶截面圖  
Sectional view of connecting track



D View



有效行程 stroke	120	180	240	300	360	420	480	540	600	660	720	780	840	900	960	1020	1080	1140	1200	1260
L	564	624	684	744	804	864	924	984	1044	1104	1164	1224	1284	1344	1404	1464	1524	1584	1644	1704
A	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120
B	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100
P	360	420	480	540	600	660	720	780	840	900	960	1020	1080	1140	1200	1260	1320	1380	1440	1500
M	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10	10	11	11
N	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30
H	8	8	10	10	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26
KG	13.7	14.6	15.5	16.4	17.3	18.2	19.1	20	20.9	21.9	22.8	23.7	24.6	25.5	26.4	27.3	28.2	29.1	30	31

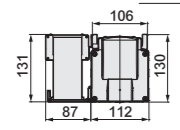
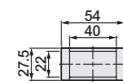
### ELR25-06-RH-D



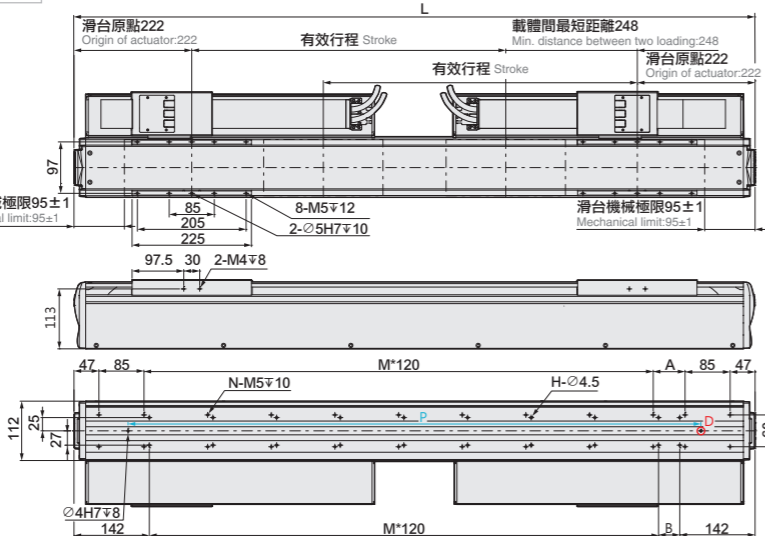
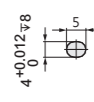
CHELIC可提供圖面

單位 Unit : mm

履帶截面圖  
Sectional view of connecting track



D View



有效行程 stroke	50	110	170	230	290	350	410	470	530	590	650	710	770	830	890	950	1010
L	744	804	864	924	984	1044	1104	1164	1224	1284	1344	1404	1464	1524	1584	1644	1704
A	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120
B	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100
P	540	600	660	720	780	840	900	960	1020	1080	1140	1200	1260	1320	1380	1440	1500
M	3	4	4	5	5	6	6	7	7	8	8	9	9	10	10	11	11
N	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30
H	10	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26
KG	24.7	25.7	26.7	27.6	28.6	29.5	30.5	31.5	32.4	33.4	34.3	35.3	36.3	37.2	38.2	39.1	40.1

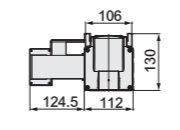
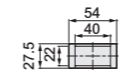
### ELR25-06-LW-D



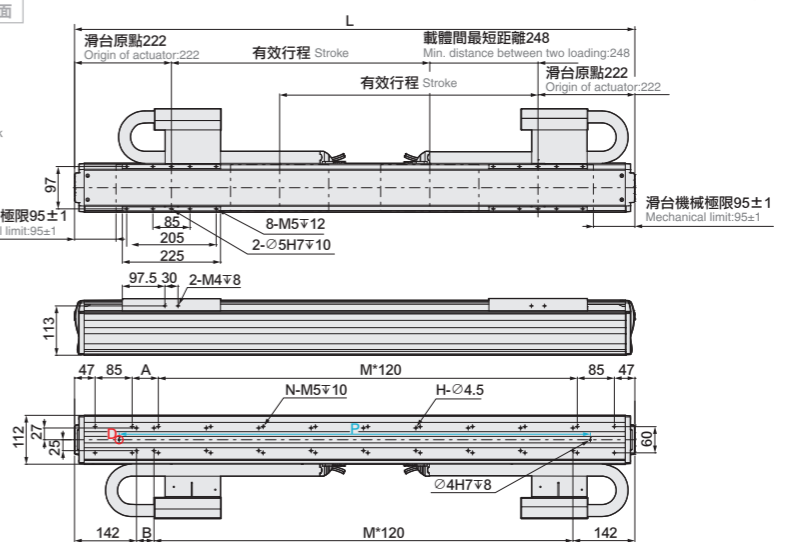
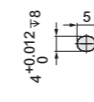
CHELIC可提供圖面

單位 Unit : mm

履帶截面圖  
Sectional view of connecting track



D View



有效行程 stroke	50	110	170	230	290	350	410	470	530	590	650	710	770	830	890	950	1010
L	744	804	864	924	984	1044	1104	1164	1224	1284	1344	1404	1464	1524	1584	1644	1704
A	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120
B	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100
P	540	600	660	720	780	840	900	960	1020	1080	1140	1200	1260	1320	1380	1440	1500
M	3	4	4	5	5	6	6	7	7	8	8	9	9	10	10	11	11
N	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30
H	10	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26
KG	24.7	25.6	26.5	27.4	28.3	29.1	30	30.9	31.8	32.7	33.5	34.4	35.3	36.2	37.1	38	38.8

# ELR32

單軸/1-axis

軸棒線馬  
Linear Shaft Motor



最大行程 Maximum Stroke	1940mm	最高速度 Maximum Speed	2500mm/s	連續推力 Continuous Thrust	187N
連續可搬重量 Continuous Payload	51kg	磁棒外徑 Outer dia. Of stator	∅32mm	直線滑軌 Linear Guide	42X9.5 1 pcs

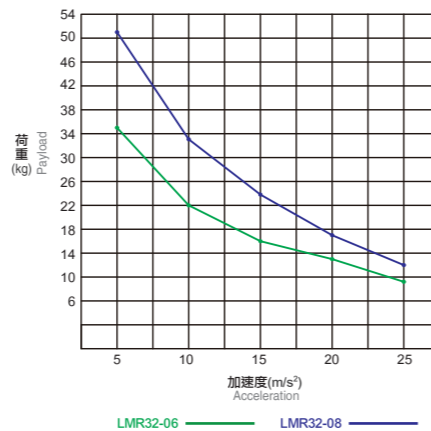
此圖僅供參考，出貨規格詳見尺寸圖面  
The picture is just for the reference. Please check the the actual dimensions on the drawing.

## 基本仕様 Specification

規格 Spec	型號 Model		
		LMR32-06	LMR32-08
位置重複精度 Repeatability (mm)	±0.002mm		
最大推力 Max. Thrust (N)	561	748	
連續推力 Continuous Thrust (N)	140	187	
連續可搬重量 Continuous Payload (kg)	35	51	
標準行程 Stroke / Pitch (mm)	單馬達 N	140-1940mm/60間隔	120-1260mm/60間隔
	雙馬達 D	75-1695mm/60間隔	50-1010mm/60間隔
最高速度 Maximum Speed (mm/s) ※1	2500mm/s		
部品 Parts	定子外徑 Outer Dia. of Stator	∅ 32	
	光學尺廠牌 Brand of Linear Scale	RENISHAW	
	讀頭 Reader	RH200X05A00A	
	Z相原點 Origin of Z Phase	A-9541-0037	
	光學尺解析度 Resolution of Linear Scale	0.001mm	

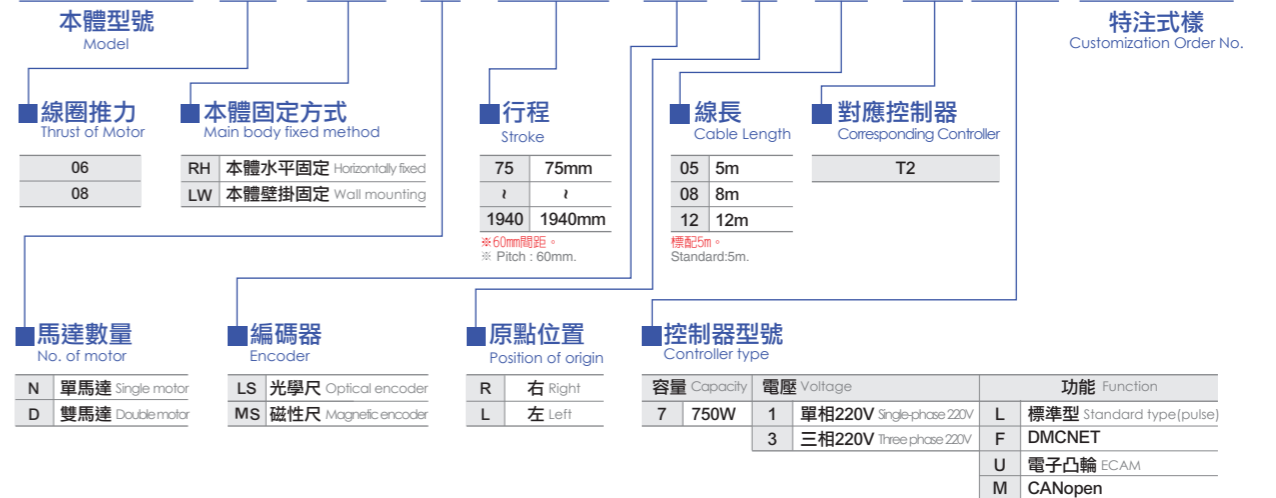
※1 連續可搬重量為到達線速度1m/s，最大加速度5m/s<sup>2</sup>固定行程來回，不同情況會有不同。  
The continuous payload is the data when the robot runs with maximum speed 1m/s and acceleration 5m/s<sup>2</sup>. Different application will have different result.

## 加速度-連續可搬重量 Acceleration-Continuous Payload

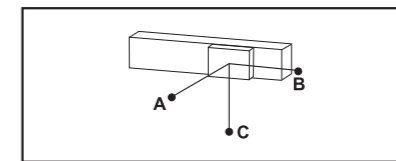
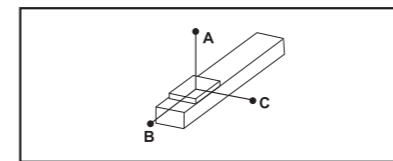


## 型號表示方式 Ordering Method

# ELR32-06-RH-N-1940-LS-R-05-T271L-A001



## 容許負載力距表 Allowable Overhang



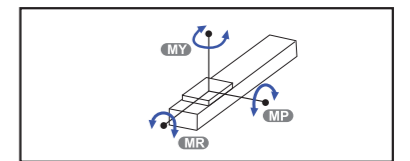
(單位 Unit:mm)

水平安裝 Horizontal Installation ※2					
速度 Speed (m/s)	荷重 Load (kg)	A B C			
		1	35	315	84
1	17	720	203	116	
1.5	22	216	99	54	
1.5	11	480	230	125	
2	14.3	180	126	61	
2	7	400	294	140	
2.5	10	200	195	83	
2.5	5	425	425	180	
1	51	272	64	27	
1	25	660	180	77	
1.5	29	218	95	38	
1.5	15	480	225	92	
2	19	180	122	46	
2	10	380	275	102	
2.5	13	208	200	68	
2.5	6	495	490	165	

(單位 Unit:mm)

壁掛安裝 Wall Installation ※2					
速度 Speed (m/s)	荷重 Load (kg)	A B C			
		1	38	43	72
1	19	105	178	640	
1.5	22	54	99	205	
1.5	11	125	230	480	
2	14.1	62	129	182	
2	7	140	294	400	
2.5	10	83	195	200	
2.5	5	180	425	425	
1	51	27	55	230	
1	25	76	154	570	
1.5	29	38	81	185	
1.5	15	90	195	410	
2	19	44	105	152	
2	10	99	235	325	
2.5	13	65	173	178	
2.5	6.5	145	385	385	

## 靜態容許負載慣量 Static Loading Moment



(單位 Unit:N.m)

型號 Model	MY		MP		MR	
	LMR 32 - 06	173	173	111	111	111
LMR 32 - 08	209	209	111	111	111	

※2 相同速度下加速度時間不同，加速度也隨之變化，荷重也隨之改變，表為加速度時間0.2s。  
Even the speed is same, if acceleration and acceleration time is changed, the payload will be different. Above chart is based on acceleration time 0.2 sec.

## 對應控制器一覽表 Corresponding Controller Chart

外觀 Exterior	控制器型號 Controller Model	選配介面 Control Mode	電氣規格 Electrical Spec.	詳細參閱 Reference Page
	T2	標準型 Pulse Control Mode	單相或三相220V Single-phase 220V or Three phase 220V	P.533
		DMCNET		
		電子凸輪 ECAM		
		CANopen		

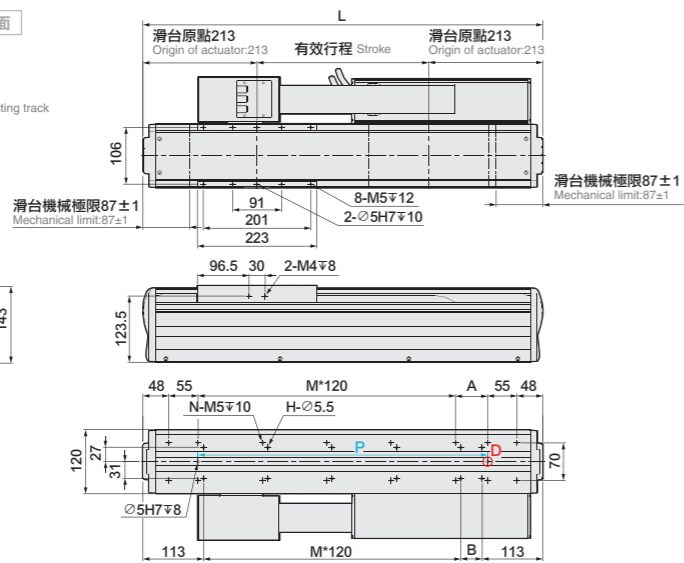
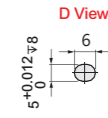
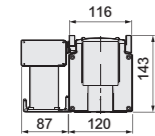
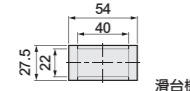
### ELR32-06-RH-N



CHELIC可提供圖面

單位 Unit : mm

履帶截面圖  
Sectional view of connecting track



有效行程 stroke	140	200	260	320	380	440	500	560	620	680	740	800	860	920	980	1040	1100	1160	1220	1280	1340	1400	1460	1520	1580	1640	1700	1760	1820	1880	1940
L	566	626	686	746	806	866	926	986	1046	1106	1166	1226	1286	1346	1406	1466	1526	1586	1646	1706	1766	1826	1886	1946	2006	2066	2126	2186	2246	2306	2366
A	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120
B	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100
P	360	420	480	540	600	660	720	780	840	900	960	1020	1080	1140	1200	1260	1320	1380	1440	1500	1560	1620	1680	1740	1800	1860	1920	1980	2040	2100	2160
M	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10	10	11	11	12	12	13	13	14	14	15	15	16	16	17	17
N	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42
H	8	10	10	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38
KG	14.3	15.5	16.8	18	19.2	20.5	21.7	22.9	24.1	25.4	26.6	27.4	28.7	29.9	31.2	32.4	33.7	35.2	36.4	37.7	38.9	40.1	41.4	42.6	43.8	45	46.3	47.5	48.7	50	51.2

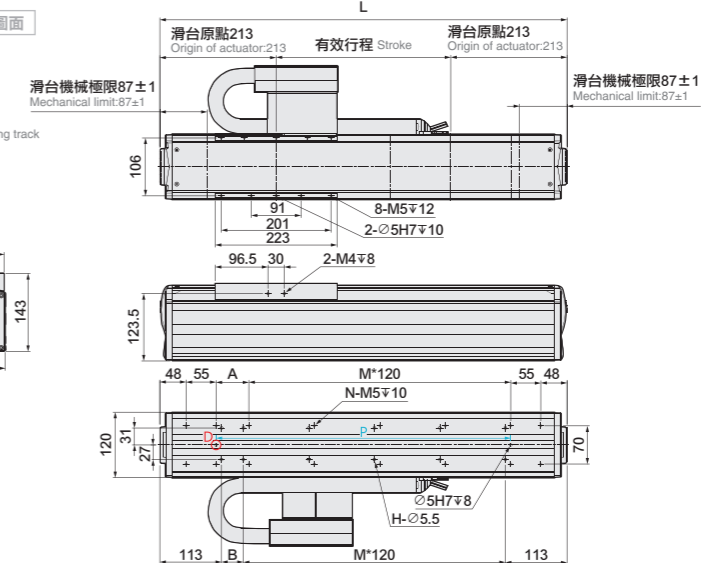
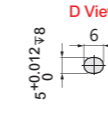
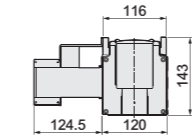
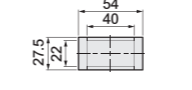
### ELR32-06-LW-N



CHELIC可提供圖面

單位 Unit : mm

履帶截面圖  
Sectional view of connecting track



有效行程 stroke	140	200	260	320	380	440	500	560	620	680	740	800	860	920	980	1040	1100	1160	1220	1280	1340	1400	1460	1520	1580	1640	1700	1760	1820	1880	1940
L	566	626	686	746	806	866	926	986	1046	1106	1166	1226	1286	1346	1406	1466	1526	1586	1646	1706	1766	1826	1886	1946	2006	2066	2126	2186	2246	2306	2366
A	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120
B	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100
P	360	420	480	540	600	660	720	780	840	900	960	1020	1080	1140	1200	1260	1320	1380	1440	1500	1560	1620	1680	1740	1800	1860	1920	1980	2040	2100	2160
M	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10	10	11	11	12	12	13	13	14	14	15	15	16	16	17	17
N	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42
H	8	10	10	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38
KG	14.6	15.7	16.9	18	19.2	20.3	21.5	22.6	23.8	24.9	26	27.2	28.4	29.5	30.7	31.8	33	34.1	35.3	36.4	37.6	38.7	39.9	41	42.1	43.3	44.5	45.6	46.8	47.9	49.1

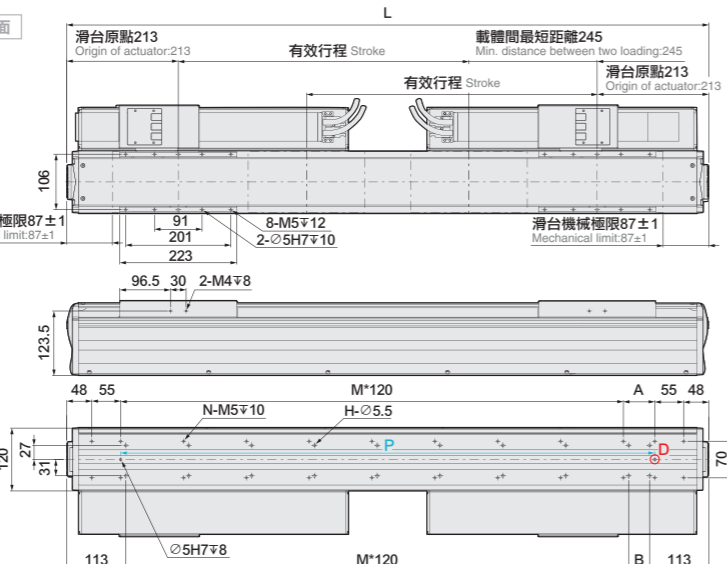
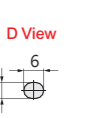
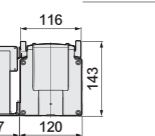
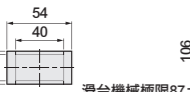
### ELR32-06-RH-D



CHELIC可提供圖面

單位 Unit : mm

履帶截面圖  
Sectional view of connecting track



有效行程 stroke	75	135	195	255	315	375	435	495	555	615	675	735	795	855	915	975	1035	1095	1155	1215	1275	1335	1395	1455	1515	1575	1635	1695
L	746	806	866	926	986	1046	1106	1166	1226	1286	1346	1406	1466	1526	1586	1646	1706	1766	1826	1886	1946	2006	2066	2126	2186	2246	2306	2366
A	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120
B	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100
P	540	600	660	720	780	840	900	960	1020	1080	1140	1200	1260	1320	1380	1440	1500	1560	1620	1680	1740	1800	1860	1920	1980	2040	2100	2160
M	4	4	5	5	6	6	7	7	8	8	9	9	10	10	11	11	12	12	13	13	14	14	15	15	16	16	17	17
N	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42
H	12	12	14	14	16	16	18	18	20	20	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40
KG	24.5	25.7	27	28.1	29.4	30.6	31.8	33.1	33.9	35.15	36.4	37.7	38.9	40.2	41.7	42.9	44.1	45.4	46.6	47.8	49	50.3	51.5	52.7	54	55.2	56.4	57.7

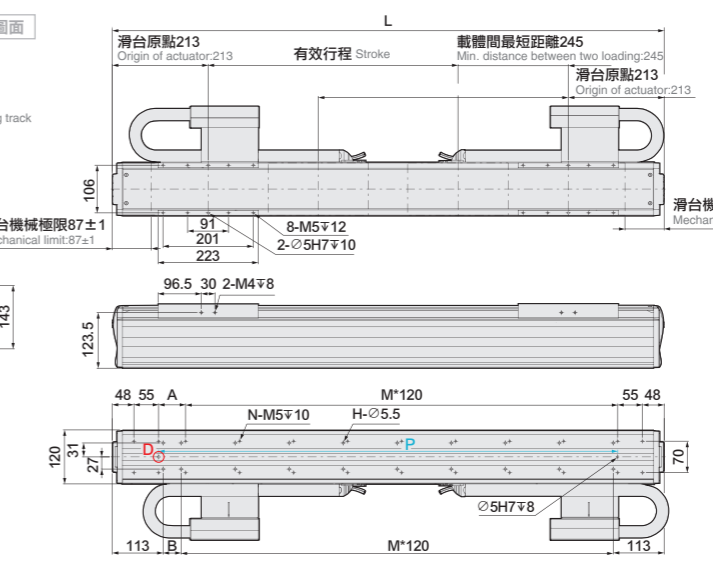
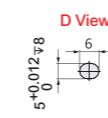
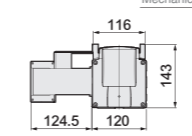
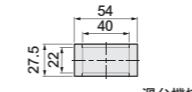
### ELR32-06-LW-D



CHELIC可提供圖面

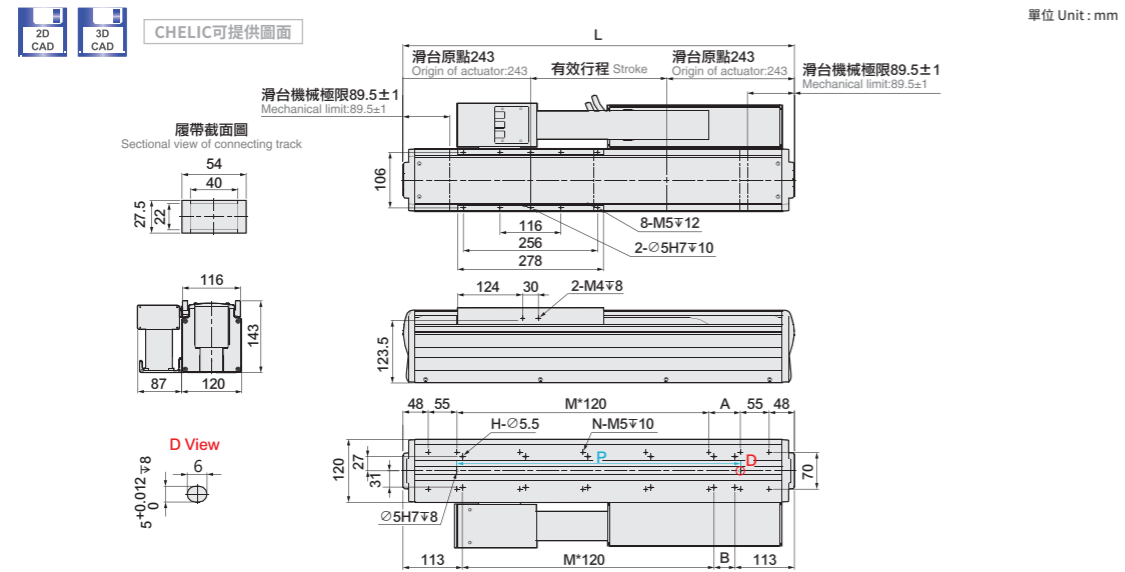
單位 Unit : mm

履帶截面圖  
Sectional view of connecting track



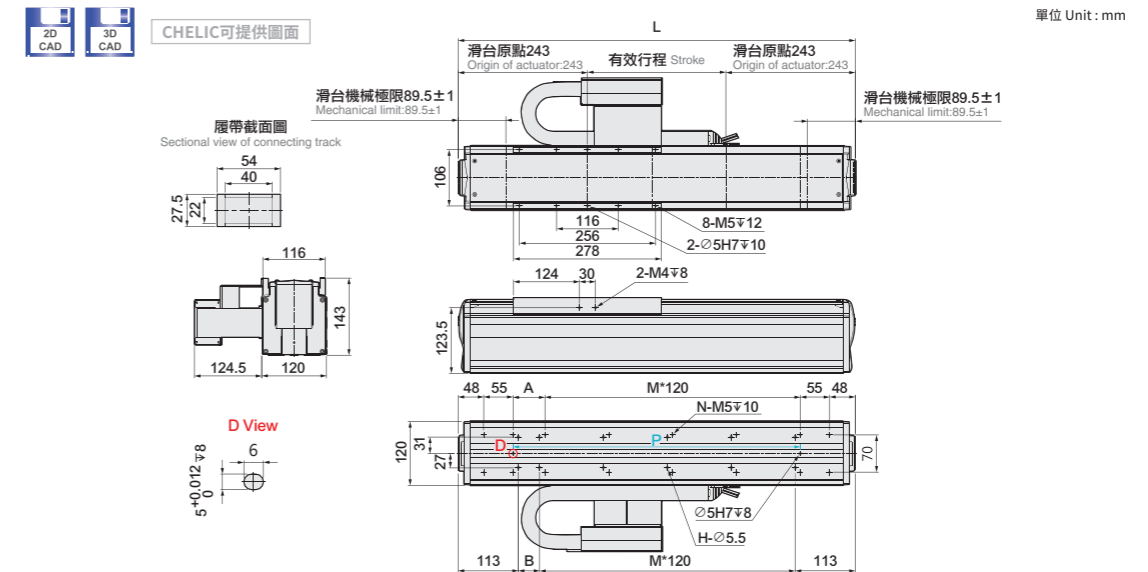
有效行程 stroke	75	135	195	255	315	375	435	495	555	615	675	735	795	855	915	975	1035	1095	1155	1215	1275	1335	1395	1455	1515	1575	1635	1695
L	746	806	866	926	986	1046	1106	1166	1226	1286	1346	1406	1466	1526	1586	1646	1706	1766	1826	1886	1946	2006	2066	2126	2186	2246	2306	2366
A	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120
B	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100
P	540	600	660	720	780	840	900	960	1020	1080	1140	1200	1260	1320	1380	1440	1500	1560	1620	1680	1740	1800	1860	1920	1980	2040	2100	2160
M	4	4	5	5	6	6	7	7	8	8	9	9	10	10	11	11	12	12	13	13	14	14	15	15	16	16	17	17
N	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42
H	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38
KG	24.4	25.5	26.6	27.8	28.9	30.1	31.2	32.3	33.5	34.6	35.8	36.9	38	39.2	40.3	41.5	42.6	43.7	44.9	46	47.2	48.3	49.4	50.6	51.7	52.9	54	55.1

### ELR32-08-RH-N



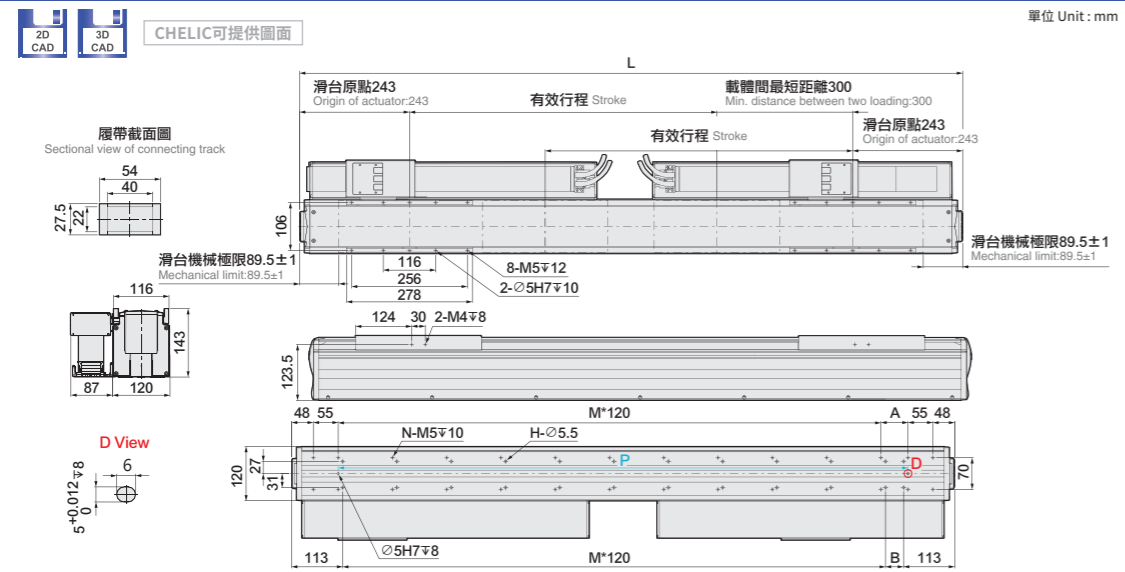
有效行程 stroke	140	200	260	320	380	440	500	560	620	680	740	800	860	920	980	1040	1100	1160	1220	1280	1340	1400	1460	1520	1580	1640	1700	1760	1820	1880
L	626	686	746	806	866	926	986	1046	1106	1166	1226	1286	1346	1406	1466	1526	1586	1646	1706	1766	1826	1886	1946	2006	2066	2126	2186	2246	2306	2366
A	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120
B	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100
P	420	480	540	600	660	720	780	840	900	960	1020	1080	1140	1200	1260	1320	1380	1440	1500	1560	1620	1680	1740	1800	1860	1920	1980	2040	2100	2160
M	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10	10	11	11	12	12	13	13	14	14	15	15	16	16	17	17
N	14	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42
H	10	10	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38
KG	17.3	18.5	19.7	20.9	22.2	23.4	24.6	25.9	27.1	28.3	29.6	30.8	32	33.2	34.5	35.7	36.9	38.2	39.4	40.6	41.9	43.1	44.3	45.5	46.8	48	49.2	50.5	51.7	52.9

### ELR32-08-LW-N



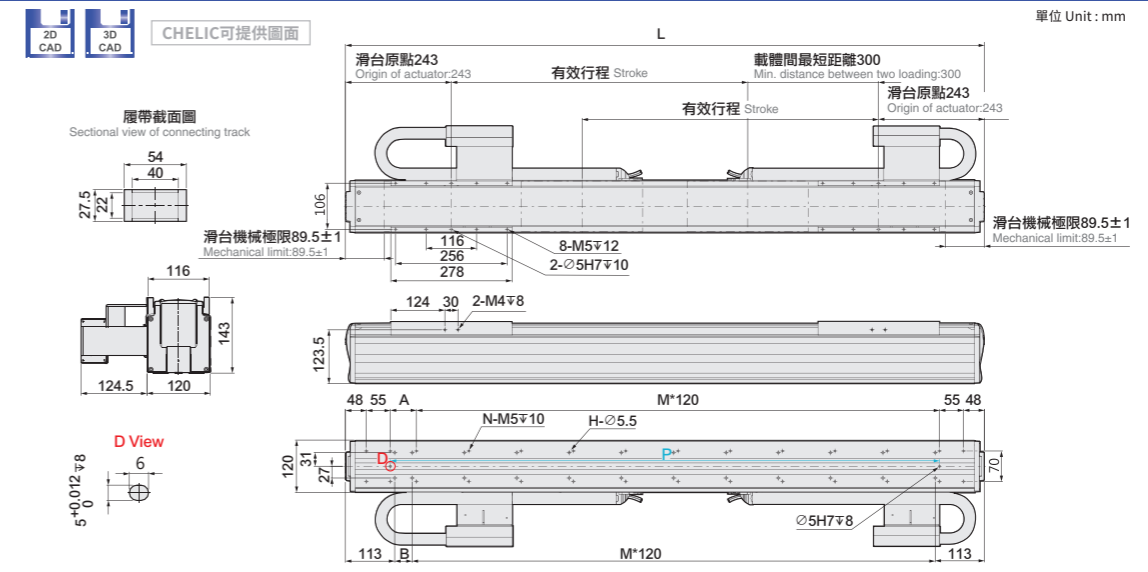
有效行程 stroke	140	200	260	320	380	440	500	560	620	680	740	800	860	920	980	1040	1100	1160	1220	1280	1340	1400	1460	1520	1580	1640	1700	1760	1820	1880
L	626	686	746	806	866	926	986	1046	1106	1166	1226	1286	1346	1406	1466	1526	1586	1646	1706	1766	1826	1886	1946	2006	2066	2126	2186	2246	2306	2366
A	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120
B	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100
P	420	480	540	600	660	720	780	840	900	960	1020	1080	1140	1200	1260	1320	1380	1440	1500	1560	1620	1680	1740	1800	1860	1920	1980	2040	2100	2160
M	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10	10	11	11	12	12	13	13	14	14	15	15	16	16	17	17
N	14	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42
H	10	10	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38
KG	17.4	18.6	19.7	20.9	22	23.2	24.3	25.5	26.6	27.8	28.9	30	31.2	32.4	33.5	34.7	35.8	37	38.1	39.3	40.4	41.6	42.7	43.9	45	46.2	47.3	48.5	49.6	50.8

### ELR32-08-RH-D



有效行程 stroke	80	140	200	260	320	380	440	500	560	620	680	740	800	860	920	980	1040	1100	1160	1220	1280	1340	1400	1460	1520	1580
L	866	926	986	1046	1106	1166	1226	1286	1346	1406	1466	1526	1586	1646	1706	1766	1826	1886	1946	2006	2066	2126	2186	2246	2306	2366
A	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120
B	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100
P	660	720	780	840	900	960	1020	1080	1140	1200	1260	1320	1380	1440	1500	1560	1620	1680	1740	1800	1860	1920	1980	2040	2100	2160
M	5	5	6	6	7	7	8	8	9	9	10	10	11	11	12	12	13	13	14	14	15	15	16	16	17	17
N	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42
H	14	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38
KG	28.9	30.1	31.3	32.6	33.8	35	36.3	37.5	38.7	40	41.2	42.4	43.6	44.9	46.1	47.3	48.6	49.8	51	52.2	53.5	54.7	55.9	57.2	58.4	59.6

### ELR32-08-LW-D



有效行程 stroke	80	140	200	260	320	380	440	500	560	620	680	740	800	860	920	980	1040	1100	1160	1220	1280	1340	1400	1460	1520	1580
L	866	926	986	1046	1106	1166	1226	1286	1346	1406	1466	1526	1586	1646	1706	1766	1826	1886	1946	2006	2066	2126	2186	2246	2306	2366
A	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120	60	120
B	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100	40	100
P	660	720	780	840	900	960	1020	1080	1140	1200	1260	1320	1380	1440	1500	1560	1620	1680	1740	1800	1860	1920	1980	2040	2100	2160
M	5	5	6	6	7	7	8	8	9	9	10	10	11	11	12	12	13	13	14	14	15	15	16	16	17	17
N	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38	40	40	42	42
H	14	14	16	16	18	18	20	20	22	22	24	24	26	26	28	28	30	30	32	32	34	34	36	36	38	38
KG	28.6	29.8	30.9	32.1	33.2	34.3	35.5	36.6	37.8	38.9	40	41.2	42.3	43.5	44.6	45.7	46.9	48	49.2	50.3	51.4	52.6	53.7	54.9	56	57.1